

half of the body is most commonly affected because of the common association of atherosclerosis and a propensity for decreased flow states. In decreasing order the femoral, popliteal, iliac arteries and aorta will be involved. Acute arterial thrombosis in the arms or neck (excluding a cerebrovascular accident) is unusual and often associated with trauma.

The exclusion of an embolus is therapeutically important because standard methods of embolectomy, though relatively safe and uncomplicated, are usually futile when acute thrombosis is present. An unsuccessful embolectomy in such a patient should alert the surgeon to possible acute thrombosis. When further attempted in these patients it may unnecessarily jeopardize limb and life. The best results have been achieved with emergent arterial reconstruction, preferably with a bypass procedure or, if the thrombosis is localized, endarterectomy. With this aggressive approach, limb salvage can be achieved in over 90 percent of cases and the rate of survival increased over that achieved with lesser procedures.

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Aortoiliac Steal Syndrome

KOUNTZ, LAUB AND CONNOLLY described a new syndrome in 1966 in which blood is shunted away from the mesenteric arterial bed into disobliterated or bypassed peripheral arteries. This stealing of blood from the mesenteric circulation can result in gangrene of the bowel after a reconstructive operation on the aortoiliac vessels. This syndrome was called the aortoiliac steal syndrome.

Animal experiments by the original authors showed that lumbar sympathectomy or iliac bypass grafting steals blood from the superior mesenteric artery in an inverse relationship to the amount of new blood diverted peripherally by the procedure.

Such stealing is normally tolerated by the mesenteric circulation unless it is severely compromised. Preoperative compromise of the mesenteric circulation is identified by the presence of an en-

larged central anastomotic artery on aortography. An enlarged central anastomotic artery always means pronounced stenosis or obstruction of two of the three mesenteric takeoff vessels.

A number of clinical reports of gangrene of the bowel secondary to the aortoiliac steal syndrome have appeared since 1966 and underscore the need for understanding this syndrome by those performing peripheral vascular surgical procedures.

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Resection of Aortic Arch Aneurysms

UNTIL RECENTLY, resection of aortic arch aneurysms with prosthetic graft replacement was a hazardous undertaking, owing largely to the complicated perfusion apparatus that has been used for circulatory support during operation. To provide complete perfusion of vital organs, inflow catheters must be placed in the innominate artery, the left carotid artery, the left brachial artery and a femoral artery. The problems of adjusting pressures and flow rates in these multiple infusion lines have generally resulted in uneven perfusion of various portions of the circulation with resulting ischemic damage.

Recently the success of the technique of total body hypothermia and circulatory arrest in dealing with complex congenital heart lesions in infants has suggested that with modification the technique might be applicable to the adult. In adult dogs if the brain temperature is less than 20°C, periods of circulatory arrest up to one hour are well tolerated. Based on these findings a technique has been developed which allows replacement of the aortic arch with the same operative risk as replacement of any other portion of the intrathoracic aorta.

Our present technique for aortic arch replacement is as follows. Following induction of anesthesia, surface cooling lowers the patient's temperature to 30°C. A median sternotomy with an

extension to the left supraclavicular area is made, and the aortic arch and its three major branches are dissected. Cardiopulmonary bypass is instituted with an inflow cannula in the femoral artery, and vena caval catheters inserted through the right atrium. A heat exchanger in the bypass circuit lowers the patient's temperature to 20°C. The circulation is stopped, and the patient's temperature drifts down to 12 to 15°C. The aortic arch vessels and the descending thoracic aorta are clamped, and the aortic arch is opened. An ellipse of aorta containing the orifices of three arch vessels is tailored and prepared for anastomosis. A dacron graft is anastomosed end-to-end to the descending thoracic aorta. A slit is cut in the superior aspect of the graft, and the ellipse of the aorta containing the arch vessels is sewn into the graft. A cross-clamp is placed around the graft proximal to the arch vessels, the other vascular clamps are removed and cardiopulmonary bypass is reinstituted. Using surface warming and a heat exchanger, the patient's temperature is brought to normal during anastomosis of the graft to the ascending aorta or, if the ascending aorta requires replacement, to the aortic annulus.

With an average-sized adult the period of core cooling is approximately 30 minutes, the period of circulatory arrest is 30 to 40 minutes and the period required for warming is one to one and a half hours. Patients awaken promptly, and in most cases ventilatory support is discontinued and ambulation is begun on the first postoperative day.

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Intestinal Bypass in the Treatment of Obesity

SHORTENING THE FUNCTIONAL intestinal tract by jejunocolostomy to cure intractable obesity fell into disrepute when the operation resulted in serious, sometimes fatal deficiency syndromes. During the past ten years the end-to-side jejunoileostomy introduced by Payne in Los Angeles has achieved increasingly wide acceptance as a safe and effective surgical cure of morbid obesity.

More recently, Scott's end-to-end jejunoileos-

tomy and Printen's gastric bypass have been introduced in an attempt to improve the results, but it is too soon to evaluate comparable long-term follow-up.

There are now hundreds of patients in many cities who have been given a new lease on life by the only treatment for massive obesity so far devised with a minimal recurrence rate.

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Pancreatic Trauma: Management and Presentation of a New Technique

INJURIES TO THE RETROPERITONEAL ORGANS, including the pancreas, are increasing in association with the high incidence of abdominal trauma caused by highway accidents. Because of its relatively protected retroperitoneal position, the injuries to the pancreas account for only 1 to 2 percent of all traumatic abdominal injuries. The types of treatment used for pancreatic injury are as varied as the location and extent of damage to this organ.

Damage to the pancreatic head requires special consideration. There are two alternatives when treating injuries in this area. One is external drainage with or without suture repair and the other is pancreaticoduodenectomy. Contusions of the pancreatic head, small parenchymal lacerations and occasionally low velocity, through-and-through gunshot wounds may be managed by external drainage alone. Pancreaticoduodenectomy is done when there is extensive devitalization of the pancreatic head, complete proximal ductal disruption, uncontrollable bleeding from the injured area or extensive devitalization of the duodenum. The rate of mortality following pancreaticoduodenectomy and reestablishment of gastrointestinal continuity is high because of inability of the patients to sustain the traumatic injury and the superimposed surgical trauma. In selected cases it may be preferable to resect the stomach, duodenum and pancreas, and exteriorize the en-